

Colorado. Robinson (1) records a similar bed, 5 feet thick, at Anderson Mesa to the south while to the north and northwest it has been noted in numerous localities by other geologists so it probably represents a fairly constant unit at the base of the Moenkopi formation.

The discovery of rocks of the Moenkopi formation on the rim of Grand Canyon adds one more geological period to the remarkably great number already known to be represented in this classical cross-section of the history of the earth. Even more than ever before can the Grand Canyon of Arizona be looked upon as a most impressive open book, recording the story of the ages.

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BOTANY.—*Studies in the Gramineae of Brazil*.—I.¹ AGNES CHASE,
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The grass flora of Brazil is of especial importance to American agrostology. Except for Muhlenberg's *Descriptio Graminum*, published in Philadelphia in 1817, the earliest work on American grasses (which in those days included sedges) was *Agrostografia Brasiliensis* by Giuseppe Raddi, published in 1823. More intensive botanical exploration was carried on in Brazil in the first three decades of the last century than in any other part of America.² Many species first described from Brazil are found in the North American tropics, for which reason it is necessary for one studying the grasses of the latter region to have a fairly detailed knowledge of the family as found in Brazil.

Since the early Brazilian collections were but poorly represented in American herbaria, three trips have been made to Brazil for the study and collection of grasses, two by the writer, in 1924-25³ and in 1929-

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² See CHASE, *Identification of Raddi's grasses*.—This JOURNAL 13: 167-169. 1923.

³ See CHASE, *Eastern Brazil through an agrostologist's spectacles*. Smithsonian Report 1926: 383-403. 1927.



Fig. 1.—*Lithachne horizontalis* from type. Plant $\times \frac{1}{2}$; staminate spikelet, pistillate spikelet with immature fruit, and two views of mature fruit, $\times 10$ dia.

30, and one by Jason R. Swallen in 1933-34. As a result of this work and of helpful cooperation from the Jardim Botânico, and the Museu Nacional, Rio de Janeiro, from the Instituto Biológico, São Paulo, and of Professor Bento Pickel, Tapera, Estado de Pernambuco, in addition to numerous collections of Gardner, Glaziov, Salzmänn, and many others, the Grass Herbarium in Washington now has the largest collection of Brazilian grasses in the world.

The study of this material has brought to light many species previously known from but a single, often fragmentary, specimen, and also a number of undescribed species. The volume on Gramineae for the *Flora Brasílica*, projected by Dr. Frederico C. Hoehne, chief of the section Botanica e Agronomia of the Instituto Biológico, São Paulo, is to be prepared by the writer. It is proposed to publish in this JOURNAL from time to time the new species and notes on some of the little known ones.

Duplicate type material of new species will be deposited in the herbarium of the Jardim Botânico do Rio de Janeiro, and so far as material allows in the herbaria of the Instituto Biológico and of the Museu Nacional. Specimens of species from the state of Minas Geraes will also be deposited in the Escola Superior de Agricultura y Veterinária, Viçosa, and those from Northern Brazil in the Museu Goeldi, Pará.

Lithachne horizontalis Chase, sp. nov.

Perennis, glabra, caespitosa; culmi steriles 10-30 cm. alti; culmi florentes longe repentes, 30-100 cm. longi, internodiis elongatis; vaginae breves; ligula minuta, fimbriata; laminae planae, oblongo-lanceolatae, 2.5-6.5 cm. longae, 8-13 mm. latae, basi inaequaliter in petiolum brevissimum subito contracta; panícula mascula terminalis, 3-4 cm. longa, 2 cm. lata, spiculis 4-6 mm. longis purpureis; spiculae feminae in nodis culmorum repentium solitariae; gluma secunda et lemma sterile 5-6 mm. longa; lemma fertile 3 mm. longum, 2 mm. latum, 3 mm. crassum, album, maturitate fusco-variegatum, cucullatum, gibbum, apiculatum; palea angusta.

Glabrous perennial in tufts of several erect sterile culms, 10 to 30 cm. tall and 1 to 4 vinelike flowering culms, these 30 to 100 cm. long, running on the ground and rooting at the nodes, simple or sparingly branching, the internodes elongate; sheaths short, slightly auricled; ligule minute, fimbriate; blades horizontally spreading, flat, 2.5 to 6.5 cm. long, 8 to 13 mm. wide, abruptly narrowed at the asymmetric base into a minute petiole hispidulous on the upper surface, the blades scabrous on the margin, especially toward the acute to acuminate apex; staminate panicles 3 to 4 cm. long, about 2 cm. wide, terminal on mostly relatively short culms, the spikelets short pediceled on the subcapillary branches, 4 to 6 mm. long, the lemma and palea purple, acute, the 3 stamens with anthers almost as long as the spikelets, the filaments very short; pistillate spikelets solitary on slender peduncles, borne at the nodes of the long creeping culms, protruding from the side of the sheath or from its summit, rarely one or two borne on the

culms producing the terminal staminate panicles, the glume and sterile lemma equal, 5 to 6 mm. long, acuminate, the glume 5-nerved, the lemma 3-nerved, both with a few obscure cross veins; fruit 3 mm. long, about 2 mm. wide and 3 mm. thick, smooth, dull white, becoming strikingly mottled with grayish brown, the lemma 5-nerved, cucullate, strongly gibbous, abruptly apiculate; palea narrow; rachilla joint remaining attached at base, as a white porcelain-like callus.

Type in the U. S. National Herbarium no. 1,255,920, collected on a moist gentle slope above streamlet, near Bello Horizonte, Minas Geraes, Brazil, March 25, 1925, by Agnes Chase (no. 9057). Known only from the type collection.

Field notes state that the plants were firmly rooted, forming a colony under coarse herbs and *Paspalum paniculatum* L., the long pistillate culms tangled under vegetation, very slender but not readily breaking in untangling; staminate panicles relatively few, the spikelets falling readily; blades flat but curling almost instantly when plants were dug. The colony was found about half a kilometer beyond the end of the Calafate bonde [street car line]. The specific name refers to Bello Horizonte, the beautiful capital of Minas Geraes, and also to the widely creeping pistillate culms.

This third species of *Lithachne* is strikingly different from the two previously known species, *L. pauciflora* (Swartz) Beauv., rather widely distributed in the American tropics, and *L. pineti* (Wright) Chase, known only from Cuba. *Lithachne pineti*, to which it is the more nearly related, is a much smaller, more delicate species, with smaller blades and spikelets, the fruits smaller, the palea pubescent with thick hairs toward the base.

OLYRA SAMPAIANA Hitchc. Journ. Washington Acad. Sci. 17:215, f. 1.—1927.

The type specimen, collected at Reeve, Estado do Espirito Santo, by José Vidal, is almost without underground parts. Specimens collected in 1929 at Alegre, Espirito Santo, about 20 kilometers west of Reeve (Chase 10049), show that the roots bear fleshy potato-like bodies, 1 to 2 cm. long and 5 to 8 mm. thick.

BOTANY.—*Centrochloa*, a new genus of grasses from Brazil.¹ JASON R. SWALLEN, Bureau of Plant Industry.

Material of a new genus of the tribe Paniceae was collected by the author in the state of Maranhão, Brazil, during a collecting trip in the early part of 1934. It occurs rather commonly on sterile sandy soil in the states of Maranhão and Goyaz in the valley of the Tocantins river, in the region of Carolina. The name of the genus is taken from the Greek *κεντρον* spur, and *χλοα*, grass, referring to the pointed callus which extends well below the articulation between the pedicel and the spikelet.

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